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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/824,282	04/02/2001	Jung-Fu Cheng	8194-491	9242

20792 7590 10/14/2004

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EXAMINER	
DEPPE, BETSY LEE	
ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 10/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/824,282	CHENG, JUNG-FU	
	Examiner	Art Unit	
	Betsy L. Deppe	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-9,11-23,27-37,42-52 and 57-65* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *10,24-26,38-41 and 53-56* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/2/01;2/8/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. The claims are objected to because of the following informalities:

in claim 3, lines 4-6, "using extrinsic information associated with the first set of symbols for demodulation of the second set of symbols" should be deleted since it duplicates claim 2, lines 11-13;

in claim 10, lines 2 and 3, "retransmission copies" should be inserted after "group of" for clarification;

in claim 18, line 2, "differential" should be "differentially";

in claim 24, lines 2 and 3, "retransmission copies" should be inserted after "group of" for clarification;

in claim 27, line 2, "differential" should be "differentially"; and

in claim 53, lines 2 and 3, "retransmission copies" should be inserted after "group of" for clarification; .

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 32 and 63 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Matsushita Electric Industrial Co., Ltd. (JP 2001-060934). Figure 4 shows an interleave circuit (102 and 103) for generating a message using two different interleave protocols, a retransmission circuit (101), a selection circuit (104) and a transmitter (105). (See abstract) It is inherent that a retransmission signal is received in order to the retransmission circuit to select a different interleaving protocol for retransmission.

4. Claims 1, 32, and 63 are rejected under 35 U.S.C. 102(e) as being anticipated by Niemela (US Patent No. 6,247,150 B1).

5. With regard to claims 1 and 63, Niemela teaches the claimed invention including generating a message for transmission using a first interleaving protocol; transmitting the message to a destination device; receiving a request for retransmission of the message; generating a second copy of the message for transmission using a second interleaving protocol different from the first interleaving protocol; and transmitting the second copy of the message to the destination device. (See abstract; Figure 4; and column 5, lines 10-25)

6. With regard to claim 32, Niemela teaches the claimed invention including an interleave circuit, a retransmission circuit, a selection circuit and a transmitter. Although

Niemela does not explicitly show the recited retransmission and selection circuits, it is inherent that the retransmission circuit is present since the transmitter changes the interleaving order before retransmission in response to the ARQ from the receiver. Furthermore, it is inherent a selection circuit is present in order to change the interleaving protocol.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2-9, 11-15, 33, 34, 64 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemela as applied to claims 1, 32, and 63, respectively, above, and further in view of Franz et al. (US Patent No. 6,222,835 B1).

9. With regard to claims 2, 3, 33, 34 and 64, Niemela discloses the claimed invention including means for receiving the message, determining if the message was received in error and receiving a second copy of the message. (See abstract; Figure 4; column 4, lines 21-31; and column 5, lines 10-25) However, Niemela does not teach iteratively demodulating the first set of symbols and the second set of symbols using extrinsic information associated with the first set of symbols for demodulation of the second set of symbols and using extrinsic information associated with the second set of

symbols for demodulation of the first set of symbols to provide a set of symbol estimates.

Figure 5 of Franz et al. discloses a method and circuit which combines retransmitted data with the originally transmitted data by iteratively demodulating the first set of symbols (y(1)) and the second set of symbols (y(2)) using extrinsic information associated with the first set of symbols (a priori information) for demodulation of the second set of symbols and using extrinsic information associated with the second set of symbols (a priori information) for demodulation of the first set of symbols to provide a set of symbol estimates. (See also column 2, lines 25-34; column 2, line 32 - column 3, line 16; column 6, lines 1-13 and 37-56 and column 7, lines 4-6) It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the retransmission signal combining method/circuit disclosed by Franz et al. in the retransmission method/system disclosed by Niemela in order to improve the likelihood of receiving a data frame that is sufficiently free of errors (see Franz et al. column 3, lines 2-6). Furthermore, since Niemela does not disclose a specific combining method in Figure 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a combining method/circuit based on factors such as desired reliability, sufficiency of using redundancy to overcome channel interference problems, and code rates. (See Franz et al. column 2, lines 7-20)

10. With regard to claims 4 and 65, Niemela in view of Franz et al. disclose the claimed invention including the ordering of the symbols and extrinsic information as

recited in claim 4, lines 8-11 and 15-18 and claim 65, lines 9-12 and 16-19. In Figure 5 of Franz et al. , interleavers (20(1) and 20(2)) order the symbols and extrinsic information as recited in the respective claims. (See also Franz et al. column 5, lines 28-37)

11. With regards to claims 5 and 6, Niemela in view of Franz et al. disclose the claimed invention including comparing extrinsic information to an acceptance criterion. (See Franz et al., column 5, lines 39-43 and column 6, lines 18-20) Since the method/circuit in Franz et al. is iterative (see column 3, lines 14-16), it is inherent/implicit that the extrinsic information is provided as the symbol estimates of the message if the acceptance criterion is met and that the extrinsic information is updated if the acceptance criterion is not met.

12. With regards to claims 7 and 8, Niemela in view of Franz et al. disclose the claimed invention including repeating the steps of claim 4 until the acceptance criterion is satisfied or until a maximum number of demodulations have passed. (See Franz et al., column 6, lines 14-23)

13. With regard to claims 9 and 14, Niemela in view of Franz et al. disclose the claimed invention including an automatic repeat request (ARQ) based communication system. (See abstract in Niemela) However, Niemela in view of Franz et al. does not teach that the first interleaving protocol comprises no interleaving. Since Niemela discloses that interleaving produces a slight additional delay in data transmission (see column 3, lines 8-10), it would have been obvious to one of ordinary skill in the art at the time the invention was made to not interleave the first transmission of a message in

order to expedite data transmission and avoid unnecessary delays caused by interleaving. Since the system uses ARQ protocol, interleaving can subsequently be used when enhanced error correction and detection is necessary.

14. With regard to claims 11-13 and 15, Niemela in view of Franz et al. disclose the claimed invention. (See Niemela, column 4, lines 29-31; and Franz et al., Figure 5, column 5, lines 38-43 and column 6, lines 14-23)

15. Claims 16, 17, 30, 31, 48, 49, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemela view of Franz et al.

16. With regard to claims 16, 17, 48, 49, and 62, Niemela discloses the claimed invention including means for receiving the message, determining if the message was received in error and receiving a second copy of the message. (See abstract; Figure 4; column 4, lines 21-31; and column 5, lines 10-25) However, Niemela does not teach iteratively demodulating the first set of symbols and the second set of symbols using extrinsic information associated with the first set of symbols for demodulation of the second set of symbols and using extrinsic information associated with the second set of symbols for demodulation of the first set of symbols to provide a set of symbol estimates.

Figure 5 of Franz et al. discloses a method and circuit which combines retransmitted data with the originally transmitted data by iteratively demodulating the first set of symbols (y(1)) and the second set of symbols (y(2)) using extrinsic information associated with the first set of symbols (a priori information) for

demodulation of the second set of symbols and using extrinsic information associated with the second set of symbols (a priori information) for demodulation of the first set of symbols to provide a set of symbol estimates. (See also column 2, lines 25-34; column 2, line 32 - column 3, line 16; column 6, lines 1-13 and 37-56 and column 7, lines 4-6) It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the retransmission signal combining method/circuit disclosed by Franz et al. in the retransmission method/system disclosed by Niemela in order to improve the likelihood of receiving a data frame that is sufficiently free of errors (see Franz et al. column 3, lines 2-6). Furthermore, since Niemela does not disclose a specific combining method in Figure 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a combining method/circuit based on factors such as desired reliability, sufficiency of using redundancy to overcome channel interference problems, and code rates. (See Franz et al. column 2, lines 7-20)

17. With regard to claim 30, Niemela in view of Franz et al. disclose the claimed invention including an automatic repeat request (ARQ) based communication system. (See abstract in Niemela) However, Niemela in view of Franz et al. does not teach that the first interleaving protocol comprises no interleaving. Since Niemela discloses that interleaving produces a slight additional delay in data transmission (see column 3, lines 8-10), it would have been obvious to one of ordinary skill in the art at the time the invention was made to not interleave the first transmission of a message in order to expedite data transmission and avoid unnecessary delays caused by interleaving.

Since the system uses ARQ protocol, interleaving can subsequently be used when enhanced error correction and detection is necessary.

18. With regard to claim 31, Niemela in view of Franz et al. disclose the claimed invention. (See Niemela, column 4, lines 29-31; and Franz et al., Figure 5, column 5, lines 38-43 and column 6, lines 14-23)

19. Claims 18-23, 27-29, 35-37, 42-47, 50-52, and 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemela in view of Franz et al. as applied to claims 17, 34 and 49, respectively, above, and further in view of Khayrallah (US Pub. No. 2001/0033621 A1).

20. With regard to claims 18, 35 and 50, Niemela in view of Franz et al. discloses the claimed invention except for the first and second copy of the message comprising differentially modulated signals. Khayrallah teaches differentially coding interleaved data in a transmitter to improve bit error performance. (See Figure 3 and paragraphs [0046] and [0048]) It would have been obvious to one of ordinary skill in the art at the time the invention was made to differentially encode the interleaved data in the circuit taught by Niemela in view of Franz et al. in order to improve bit error performance and possibly reduce the number of necessary retransmissions to receive an acceptable frame of data. If the transmitter uses a differential modulation protocol, the receiver must use a differential demodulator in order to accurately recover the transmitted message. Furthermore, demodulator disclosed in Franz et al. is a soft-input, soft-output demodulator. (See column 2, lines 42-49)

21. With regards to claims 19, 20 and 24, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention including comparing extrinsic information to an acceptance criterion. (See Franz et al., column 5, lines 39-43 and column 6, lines 18-20) Since the method/circuit in Franz et al. is iterative (see column 3, lines 14-16), it is inherent/implicit that the extrinsic information is provided as the symbol estimates of the message if the acceptance criterion is met and that the extrinsic information is updated if the acceptance criterion is not met.

22. With regards to claims 21 and 22, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention including iteratively repeating the recited steps until the acceptance criterion is satisfied or until a maximum number of demodulations have passed. (See Franz et al., column 6, lines 14-23)

23. With regard to claim 23, Niemela in view of Franz et al. and Khayrallah discloses the claimed invention including an automatic repeat request (ARQ) based communication system. (See abstract in Niemela) However, Niemela in view of Franz et al. and Khayrallah do not teach that the first interleaving protocol comprises no interleaving. Since Niemela discloses that interleaving produces a slight additional delay in data transmission (see column 3, lines 8-10), it would have been obvious to one of ordinary skill in the art at the time the invention was made to not interleave the first transmission of a message in order to expedite data transmission and avoid unnecessary delays caused by interleaving. Since the system uses ARQ protocol, interleaving can subsequently be used when enhanced error correction and detection is necessary.

24. With regard to claims 27-29 and 57-59, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention. (See Niemela, column 4, lines 29-31; and Franz et al., Figure 5, column 5, lines 38-43 and column 6, lines 14-23)

25. With regard to claims 36 and 51, Niemela in view of Franz et al. and Khayrallah discloses the claimed invention including differential 8-phase shift keying. (See Khayrallah, paragraph [0046]) At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a differential modulation protocol since the Applicant has not disclosed that a particular differential modulation protocol provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with any differential modulation protocol. The type of modulation protocol is a matter of design choice based on considerations such as the desired transmission rate, bit error rate, and/or channel noise.

26. With regard to claims 37 and 52, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention including an error detection circuit since it is implicit that a retransmission request is sent only when an error is detected. (See Niemela, column 4, lines 42-53) Furthermore, it is inherent that there is a transmitter for transmitting the request for retransmission.

27. With regard to claim 42, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention including selecting at least three different interleaving protocols. (See Niemela column 6, line 51 - column 7, line 10)

28. With regard to claims 44-47, 60 and 61, Niemela in view of Franz et al. and Khayrallah disclose the claimed invention including the ordering of the symbols and extrinsic information and generating the extrinsic information for the three sets of symbols. In Figure 5 of Franz et al., interleavers (20(1) and 20(2)) order the symbols and extrinsic information as recited in the respective claims. (See also Franz et al. column 5, lines 28-37)

Allowable Subject Matter

29. Claims 10, 24-26, 38-41 and 53-56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

30. The following is a statement of reasons for the indication of allowable subject matter: prior art of record does not teach or suggests in combination a method or system comprised of the limitations recited in claims 10, 24, 38 and 53, respectively, in combination with the limitations recited in the respective base and intervening claims.

Conclusion

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Wednesday and Thursday (8:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272 - 2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Betsy L. Deppe
Primary Examiner
Art Unit 2637